December 2000
Draft RG-052

Technical Guidance Package for: Agricultural Sources

Feedmills

printed on
recycled paper

Air Permits Division

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Copies of this publication are available for public use through the Texas State Library, other state depository libraries, and the TCEQ Library, in compliance with the state depository law. For more information on TCEQ publications call (512) 239-0028 or visit our Web site at:

www.tceq.state.tx.us

Published and distributed by:
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Technical Guidance for Agricultural Sources

THIS PACKAGE IS INTENDED FOR INSTRUCTIONAL USE ONLY

References to abatement equipment technologies are not intended to represent minimum or maximum levels of Best Available Control Technology (BACT). Determinations of BACT are made on a case-by-case basis as part of the New Source Review of permit applications. BACT determinations are always subject to adjustment in consideration of specific process requirements and recent developments in abatement technology. Additionally, specific health effects concerns may require more stringent abatement than required by the BACT determination..

The represented calculation methods are intended as an aid in the completion of acceptable submittals; alternate calculation methods may be equally acceptable if they are based on, and adequately demonstrate, sound engineering assumptions or data.

The enclosed regulations are applicable as of the publication date of this package, but are subject to revision during the application preparation and review period. It is the responsibility of applicants to remain abreast of regulation developments which may affect their industries.

The special conditions included in this package are for purposes of example only. Special Conditions included in an actual permit are written by the reviewing engineer to address specific permit requirements and operating conditions.

Table of Contents

OVERVIEW: SYNOPSIS OF PERMIT REVIEW

Who needs a permit?

"Any person who plans to construct any **new** facility or to engage in the **modification** of any existing facility of this state which may emit air contaminants into the air must obtain a permit to construct pursuant to" Texas Commission on Environmental Quality (TCEQ) Rule 116.111, commonly known as Regulation VI; "or, satisfy the conditions for exempt facilities pursuant to" TCEQ Rule 116.211, commonly known as Regulation VI, "**before any actual work is begun on the facility.**"

If your facility began operating after September 1, 1971 you must obtain a permit, unless the facility qualifies for an exemption. The facility must meet all applicable conditions of an exemption to qualify. Facilities that started operating before September 1, 1971 and have not changed or modified their operations are considered grandfathered from the permit requirements.

How do you obtain a permit?

The majority of review time for a construction permit or amendment is spent in correspondence between the applicant and the permit engineer assigned to the project. Several manuals have been developed for specific industries to help streamline the permit process and decrease the review time of the permit. By submitting a complete permit application your review time can be decreased significantly.

The first step to obtaining a permit is submitting a **complete application** to the TCEQ in Austin. Much delay and confusion can be avoided by submitting copies of the application and all subsequent correspondence to the TCEQ Regional Office and any local air pollution control program(s) with jurisdiction over the proposed facility. Once the TCEQ receives the permit application, a C.O.R.E. engineer is assigned to review the administrative completeness of the application. The

administrative review is an initial check to ensure that all the requirements of the Form PI-1 have been addressed. When the permit application is determined to be administratively complete, then a permit engineer is assigned to perform the technical review of the project.

There are three major parts to the technical review. The first part of the review verifies that all **emission sources** have been identified and the **emission rates** have been correctly calculated. Any parameters used to determine emissions becomes a condition of your permit, including equipment specifications, operational methods, maximum throughputs, and/or raw materials. The permit engineer uses the following information to complete this part of the review: process description, process flow chart, various tables and charts, and the submitted emission calculations.

Second, after the emission sources have been identified and evaluated, the permit engineer begins reviewing the proposed control technology. TCEQ Rule 116.111(3), commonly known as Regulation VI, requires the application of the **best available control technology** (BACT) for all permitted emission sources.

Once the TCEQ and the applicant agree on the appropriate controls for the facility, the permit engineer may require the applicant to perform dispersion modeling on the proposed emissions from the facility. The TCEQ Modeling Section has guidelines on modeling protocol and **must** be consulted before any official modeling is performed. The predicted off-property concentrations of the proposed emissions may be submitted to the TCEQ Toxicology and Risk Assessment Section for a toxicological review.

Sometime during the technical review the permit engineer will instruct the applicant to publish notices and post signs at the facility. These notices provide information to the public regarding the project. During the comment period the public has the right to make comments, request a public meeting, or request a public hearing.

When all the above-mentioned technical issues have been resolved, the permit engineer then will draft the **permit special conditions**. The conditions will be sent to the applicant for review and comment. Once the permit engineer, applicant, appropriate regional office, and local program(s) with jurisdiction agree on the permit special conditions, the permit package will be prepared and routed for approval.

Supplemental Information Sheet
for Grain Elevators/Feedmills
TCEQ Office of Air Quality

In addition to general application forms, several items are needed to adequately evaluate an application for a grain elevator or feed mill. These items include, but are not limited to:

1. A cover letter giving a brief description of the expansion, replacement, or construction proposal and what action is being requested from the Texas Commission on Environmental Quality (TCEQ) (i.e. construction, amendment, revision, renewal). Any previous contact with the TCEQ should be discussed and this letter should indicate where copies of the application are being sent.

2. A complete history of the facility indicating dates and descriptions of original construction, ownership changes, and expansion projects. Discuss any dust or odor problems encountered with neighbors or the TCEQ and how they were resolved, see the Compliance History instructions attached to Form PI-1.

3. a. Is this a country or terminal grain elevator, commercial feedmill, or on-site feedmill?
   b. List all grains and commodities to be received at this facility.
   c. List all finished products shipped from this facility.
   d What is the maximum hourly receiving rate for each item in 3b.
   e. Method of receiving grains and commodities (approximate percentages):
   _____% received by hopper bottom railcar;
   _____% received by hopper bottom truck;
   _____% received by bobtail dump truck.
   f. What is the maximum hourly milling/mixing rate expected with your given operation?
   g. What is the maximum hourly loadout/shipping rate for each item in 3b.
   h. What is the maximum hourly loadout/shipping rate for each item in 3c.
   i. What is the maximum annual throughput for each item in 3b?
   j. What is the maximum annual throughput for each item in 3c?

k. Facilities with more than one receiving pit or loadout spout should identify each pit and spout and the percentage of annual throughput handled through each pit or spout.
l. Are there any schools within 3000 feet of this operation?
m. What is the normal operating season/schedule for this operation?
n. List any chemical/pesticide usage and how it is applied.

4. List each storage bin, the individual storage capacity for each bin, and the maximum one time storage capacity for this facility in bushels. If the one time storage capacity is greater than 2.5 million bushels, the facility is subject to NSPS Subpart DD. Facilities handling grains for human consumption are subject to Subpart DD if the storage capacity exceeds 1 million bushels. Facilities subject to NSPS should so indicate and supply the necessary information to show compliance with Subpart DD (copies available upon request).

5. List all dryers (column or rack), roasters, or other fuel fired equipment. Include their individual rated hourly capacity of grain, maximum annual throughput of grain expected, individual Btu rating and the type of fuel being burned. Specifications should be supplied for all dryers indicating inlet and outlet screen perforation sizes for column type dryers. What is the average number of times grain is run through the dryer?

6. A block flow diagram of the operation. This should identify each receiving area, loadout area, fans, dryers, cleaning equipment, control devices, storage bins and any other pieces of equipment. For expansion projects, the changes or additions should be highlighted and it may prove helpful to show a before and after block flow diagram. Everything on the diagram should be labeled and assigned an I.D. (such as F1 for fan #1 or C1 for cyclone #1) that can be referred back to in other portions of the application (i.e. process description, plot plan).

7. A plot plan showing the property line, all buildings, receiving and loadout areas, parking lots, traffic pathways, an approximate scale, and a north arrow. Label any areas paved or treated with dust suppressants.
8. A written process description of the operation that carries the reader smoothly through the process. Describe how all products are received (truck or rail), conveyed (pneumatically, augers, elevators, or front-end loaders), processed, stored, and shipped. Identify the rated

hourly capacity for each individual stage and what is being accomplished at each stage. This description should identify each potential fugitive source (receiving, loadout, and transfer points) and each point source (dryer, cyclone, bagfilter exhaust points).Include the I.D.s from the flow diagram and note which items are being proposed for expansion projects.

9. Control of Emissions. This discussion should identify potential emission sources and the control devices or methods utilized for controlling/eliminating these sources. Discuss the use of enclosed conveying, "choke feeding" (allowing receiving pits to fill up before the operation of any receiving conveyors commences), enclosed receiving/loadout areas, high efficiency cyclones, bagfilters, mineral oils for controlling grain dust or paving for controlling road dust.

10. A detailed description of all maintenance and housekeeping procedures employed by the facility for ensuring nuisance odors/dust will not occur. Discuss inspection/maintenance of control devices, removal of spillage, repairing of pot holes to prevent standing water/grain spoilage. Any mills handling rendering by-products should identify how the material is stored and used to prevent nuisance odors.

11. A fan chart. This chart should list each fan, it's I.D., it's purpose (i.e. hammermill #1 fan), the maximum and average flow rates expected for this installation (cfm), and the proposed control device (i.e. quad 36" 1D-3D cyclones or bagfilter).

12. Completed cyclone tables (TCEQ Table 10) for each cyclone. At a minimum, these tables should include the fan I.D. and name/purpose, maximum and average flow rates, type and configuration, and physical dimensions. Calculations should be provided to identify the inlet velocities for each cyclone to ensure that the cyclones were sized properly. This is calculated by dividing the expected average flow rate by the B and H dimensions (inlet area) on the Table 10s.

13. Completed scrubber tables (TCEQ Table 13) for each scrubber. At a minimum, these tables should include the point number, name of abatement device, maximum and average flow rates, scrubbing liquid composition and weight percent, scrubber type, and liquid injection rates. In addition, you should include the scrubber stack height, scrubber packing depth, residence time

of gas stream in scrubber and packing material, and description of makeup water (recycle or single circulation).

14 Completed bag filter tables (TCEQ Table 11) for each bag filter. In addition, a manufactures guarantee for outlet grain loading rates should be included.

15. An area highway map with the proposed location clearly marked. If needed, provide additional instructions for locating the proposed site by vehicle.

16. A land use map. This map should have a north arrow, an approximate scale, and should identify the property line, major structures on-site and the distance and direction to any residences, schools, businesses or occupied structures within a 3000 foot radius of the proposed location. Any surrounding farmland or ranchland should be identified and any off-site structures owned or operated by the applicant should be identified. The prevailing wind patterns during the operating season should also be identified on the map. If requested, the Austin office of the TCEQ can provide wind rose data for the different areas around the state.

17. The capital cost of the proposed operation or the proposed expansion (Not required for renewal applications). (See TCEQ Table 30).

18. Application Fee. A minimum fee of $450.00 is required for all construction and amendment applications. This fee is based on the capital cost of the proposed project (See Item 17 above). A minimum fee of $300.00 is required for all renewal applications. This fee is based on the permitted allowable emission rates negotiated in the renewal process. The application fee should be mailed to the Austin office with the application.

19. A Certificate of Good Standing from the Comptroller's Office for incorporated facilities (Not required for renewals, revisions or amendments). The Comptroller's Office (phone # 1-800-252-1386) can provide a statement of exemption for corporations exempt from paying a franchise tax. Facilities not incorporated should supply a statement identifying their capital structure (i.e. sole proprietorship, partnership, cooperatives etc.).

20. Copies of this supplemental information sheet and any other references should be submitted with the application.

The attached general application and application forms should be completed and mailed with the information requested above to the Austin Office, the appropriate regional office of the TCEQ and to any city or county air programs with jurisdiction over the area of the proposed operation.

APPENDIX A:

PERMIT APPLICATION FORMS

FEEDMILLS

CONTENTS:

APPENDIX B:

EXAMPLE PERMIT & CONDITIONS

FEEDMILLS

CONTENTS:

INTRODUCTION

This section is designed to provide the applicant with an idea of what a permit might look like and what information it might include. The permit which follows is **only an example**. It is important to remember that each review, and each permit, is reviewed on a case-by-case basis and each permit will be uniquely different.

It is also important to remember that Regulation VI Rule 116.116(a) states that all representations made in an application are conditions upon which a permit is issued, **regardless of whether specifically mentioned in the permit conditions**. Any changes made to the facility with regard to the construction or operation that differ from the permit application **must be authorized by the TCEQ prior to implementation**.

SPECIAL CONDITIONS

Permit No. 00000

EMISSION LIMITATIONS

1. Total emissions from these facilities shall not exceed the values stated on the attached table entitled "Emission Sources - Maximum Allowable Emission Rates."
   Emission limits for the facility are based on the following:

SOURCE NAME	MAXIMUM HOURLY THROUGHPUT (TONS)	MAXIMUM ANNUAL THROUGHPUT (TONS)
Truck Receiving Pit	200	145,400
Railcar Receiving Pit No. 1	200	218,100
Railcar Receiving Pit No. 2	200	218,100
Pneumatic Receiving System	20	145,400
Receiving Turnhead System	200	436,200
Hammermilling Sytem No. 1	50	218,100
Hammermilling System No. 2	50	218,100
Ground Grain Turnhead System	200	436,200
Feed Mixing System	50	727,000
Mixed Feed Turnhead System	50	727,000
Pellet Cooler System	110	727,000

Truck Loadout	200	727,500

500 Hp Boiler: Emission limits are based on an operation schedule of 24 hrs/day, 7 days/wk, 52 wks/yr.

No changes shall be made to the above limitations without prior approval by the Texas Commission on Environmental Quality (TCEQ).

OPACITY/VISIBLE EMISSION LIMITATIONS

2. Opacity of emissions from Dust Collection Systems, emission point numbers (EPN's) 2, 4, 5, 6, 7, 8, 9 and 10 must not exceed 0 percent averaged over a six-minute period, except for those periods described in Rule 111.111(a)(1)(E) of Regulation I.

OPERATIONAL REQUIREMENTS AND WORK PRACTICES

3. Fugitive emissions from all receiving pits shall be minimized through the use of "choke feeding". Operation of conveyors associated with receiving shall not commence until the receiving pits are full.

4. Suction shall be pulled from one of the railcar receiving areas, when this receiving area is in operation, to minimize fugitive emissions.

5. The railcar receiving area, where suction is being pulled, shall be completely enclosed. Both sets of doors shall remain closed while receiving grain and commodities.

6. The loadout area shall be completely enclosed. Both sets of doors shall remain closed while unloading finished feed products.

7. All loadout devices (augers, drop spouts, etc.) shall be equipped with drop socks at the drop point to minimize fugitive emissions from loadout areas. These socks shall be kept in good

repair at all times.

8. Sodium hypochlorite and sodium hydroxide shall be used in the scrubber systems for odor control and the following conditions shall apply:

   A. Sodium hypochlorite shall be added continuously to the scrubber solution along with fresh make-up water as specified by the manufacturer.

   B. A minimum residual chlorine concentration of 10 ppm and a minimum pH of 11 shall be maintained in the scrubber recycle tank.

9. An odor detection (sniff) tube shall be installed in each scrubber exhaust stack and vented to near ground level so that samples of the scrubber exhaust may be evaluated by olfactory means. An observer should be able to detect a slight aroma of chlorine from this tube at all times. If rendering odors are detected, the concentration of chemicals in the scrubber shall be increased until the rendering odors are no longer detectable by olfactory means.

10. Written approval shall first be received from the Executive Director of the TCEQ before odor treatment chemicals, other than that designated in the application, may be used in the scrubber systems.

11. Spillage of any raw products or waste products shall be picked up and properly disposed of on a daily basis.

12. All in-plant roads, parking areas, and traffic areas shall consist of a non-dusty base material, be watered, treated with effective dust suppressant(s), and/or paved and cleaned as necessary to achieve control of dust emissions.

RECORDKEEPING

13. Records of annual throughputs shall be maintained at this facility and made available during site inspections at the request of personnel from the TCEQ to show compliance with Special Condition No. 1. These records shall be totalled for each calendar month and retained for a

rolling 24-month period.

14. Records of the minimum residual chlorine concentration and the pH level of the scrubber recycle tanks shall be recorded daily and maintained in a file at the plant site and made available during site inspections upon request of personnel from the TCEQ to show compliance with Special Condition No. 8. These records shall be retained for a rolling two-year period.

EXAMPLE EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit No. 00000

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates #/hr	Emission Rates TPY
1	Truck Receiving Pit (a)	TSP	10.08	3.07
		PM_{10}	5.04	1.53
2	Railcar Receiving Pit No. 1 Bagfilter (b)	PM10	1.06	0.58
3	Railcar Receiving Pit No. 2 (b)	TSP	5.22	2.84
		PM_{10}	2.61	1.42
4	Pneumatic Receiving System Bagfilter (c)	PM_{10}	0.21	0.78
5	Receiving Turnhead			

	System Bagfilter (d)	PM_{10}	0.17	0.19
6	Hammermilling			
	System No. 1 Bagfilter (e)	PM_{10}	0.30	0.65
7	Hammermilling			
	System No. 2 Bagfilter (e)	PM_{10}	0.30	0.65
8	Ground Grain Turnhead			
	System Bagfilter (d)	PM_{10}	0.17	0.19
9	Feed Mixing			
	System Bagfilter (f)	PM_{10}	0.34	2.49
10	Mixed Feed Turnhead			
	System Bagfilter (f)	PM_{10}	0.17	1.24
11	Pellet Cooler			
	System Scrubber (g)	PM_{10}	2.20	7.27
12	Truck Loadout (h)	TSP	0.90	3.27
		PM_{10}	0.45	1.64

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates #/hr	TPY
13	500 Hp Boiler (i)	PM_{10}	0.29	1.26
		SO_2	0.01	0.06
		NOX	2.93	12.83
		CO	0.73	3.21
		VOC	0.12	0.53

(1) Emission point identification - either specific equipment designation or emission point number

from plot plan.

(2) Specific point source name. For fugitive sources use area name or fugitive source name.

(3) TSP - total suspended particulate matter, including PM_{10}
PM_{10} - particulate matter less than 10 microns in diameter
SO_2 - sulfur dioxide
NO_x - nitrogen oxides
CO - carbon monoxide
VOC - volatile organic compounds as defined in General Rule 101.1

(a) Emission rates are based on and the facilities are limited to an hourly throughput of 200 tons and an annual throughput of 145,400 tons of grain.

(b) Emission rates are based on and the facilities are limited to an hourly throughput of 200 tons and an annual throughput of 218,100 tons of grain.

(c) Emission rates are based on and the facilities are limited to an hourly throughput of 20 tons and an annual throughput of 145,400 tons of bulk commodities.

(d) Emission rates are based on and the facilities are limited to an hourly throughput of 200 tons and an annual throughput of 436,200 tons of grain.

(e) Emission rates are based on and the facilities are limited to an hourly throughput of 50 tons and an annual throughput of 218,100 tons of grain.

(f) Emission rates are based on and the facilities are limited to an hourly throughput of 50 tons and an annual throughput of 727,000 tons of mixed feed.

(g) Emission rates are based on and the facilities are limited to an hourly throughput of 110 tons and an annual throughput of 727,000 tons of feed pellets.

(h) Emission rates are based on and the facilities are limited to an hourly throughput of 200 tons and

an annual throughput of 727,000 tons of feed pellets.

(i) Emission rates are based on and the facilities are limited to an operating schedule of 8,760 hours/year.

APPENDIX C:
STATE AND FEDERAL REGULATIONS
FEEDMILLS

CONTENTS:

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

TO: Potential Grain Elevator/Feedmill Applicants

FROM: Texas Natural Resources Conservation Commission (TNRCC) Staff

DATE: January 1, 1994

SUBJECT: **BACT and Permit Requirements for Grain Handling/Feedmilling Facilities**

There have been several questions raised as to what types of construction/additions at grain handling facilities trigger Regulation VI and permit procedures. And once Regulation VI is triggered, what type of controls need to be proposed to meet the BACT (Best Available Control Technology) requirement. The following information should be used as guidelines for preliminary determination for construction. However, all applications are reviewed on a case by case basis and these guidelines are subject to change.

Which state and federal regulations apply to grain handling operations?

- TNRCC General Rules - Nuisance, Circumvention
- TNRCC Regulation I - Process Wt. Method for Ag Sources
- TNRCC Regulation VI - Permits, Renewals, Amendments, BACT, Public Notification
- NSPS - Subpart DD for Grain Elevators
- Federal PM_{10} Standard - 24 hr. and annual

What type of activity triggers Regulation VI and permit procedures?

- Construction of a new facility.
- Relocation of an existing facility.
- Changes to grandfathered facilities (built prior to September 01, 1971 and predate permit requirements) or permitted facilities that may increase the hourly or annual throughput, or a change that has a potential to increase emissions.

- Replacement of equipment with new equipment that has a higher rated capacity than that of the

old equipment.

- Renewal of permits. Any permits issued or renewed prior to December 1, 1991, will require their first renewal 15 years from the date of issuance/renewal. Any permits issued or renewed on or after December 1, 1991, will require renewal every 10 years from the date of issuance/renewal, unless otherwise noted in the special conditions. Written notification will be mailed to these operations as they approach the 15 or 10 year mark.

IMPORTANT: A permit or permit amendment must be obtained before any construction begins on a new facility and before any modifications are made to an existing facility.

What activities trigger Regulation VI and require public notice and sign posting?

- Construction of a new facility.
- Relocation of an existing facility.
- Amendments to permits where the annual emissions will increase by more than 25 tons of particulate matter, volatile organic compounds, or sulfur dioxide. Exemption from public notice can be requested by the applicant for amendments with increases less than 25 tons per year and will be considered during the review.
- Renewal of permits.

Which Standard Exemptions apply to grain handling facilities?

- No. 7, which describes certain boilers, drying or curing ovens, furnaces or other combustion units excluding stationary IC engines or turbines.
- No. 64, which describes certain modifications to feed milling operations.
- No. 74, which describes certain grain handling, storage, and drying facilities.
- No. 119, which describes noncommercial feed grinding operations.
- No. 111, which describes replacement of like for like equipment.

See the standard exemption list for exact wording and requirements for satisfying these exemptions. Anyone who plans to build and operate under any standard exemption should apply with a form PI-7

to the TNRCC Austin office. Standard exemption requests should include maps, general operation information, and specific information that shows compliance which each condition of the standard exemption. Partial compliance will result in denial of the request.

What are the <u>minimum</u> controls necessary to meet present BACT requirements for applications with rural, isolated locations (low nuisance potential) ?

- Enclosed conveying.
- Column type dryers with outlet perforations that comply with NSPS Subpart DD (no greater than 0.094 inch in diameter).
- Use of scrubbers (or equivalent) when processing feed ingredients that may have the potential to produce nuisance odors. Normally, these are rendering by-products such as bone meal, blood meal, fish meal, fish oil, fat oil, liquid fat, etc. Scrubbers must have a minimum retention time of 0.5 seconds through the packing material and 1 second through the scrubber, as well as maintain a minimum residual-free chlorine concentration of 10 ppm and a minimum pH of 11 in the scrubber recycle tank.
- Use of fabric filters (or equivalent) on all fan discharges from grinders, hammermills or any other source handling fine or dusty material.
- Manufacture's guarantee for outlet grain loading rates on all fabric filters. Usual outlet grain loading rates range from 0.005 gr/dscf to 0.01 gr/dscf.
- Well designed, high efficiency cyclones (1D-3D or 2D-2D) on all pellet cooler exhausts.
- Loadout spouts equipped with drop socks that extend inside the vehicle being loaded.
- Bin vent filters on all bins which store fine, dusty material.
- Proper maintenance of all abatement devices, duct work, and in-plant roads.
- Daily removal of any spillage of raw or finished product and waste material.

What additional controls should be considered and <u>may be required</u> for facilities in tighter locations with nearby residences, businesses, schools, etc. (high nuisance potential)?

- Enclosed receiving and loadout areas.

- Application of vegetable or mineral oil during receiving operations.
- Use of "choke feeding" for receiving operations.
- Use of a dust collection system and bagfilter on areas such as receiving pits, elevator legs, and loadout points.
- Use of surge bins to minimize dust generated during loadout.
- Paved and cleaned or dust suppressant treated parking lot and traffic areas.

In summary, any changes or additions that are thought to be insignificant and appear that no permit requirements are necessary should be proposed to the TNRCC for review or comments. Permit processing time can be greatly reduced by :

1) choosing an isolated location; and

2) submitting a well prepared application with a completed PI-1 or PI-1R form. Refer to document entitled "Supplemental Information Sheet for Grain Elevators/Feed Mills" for more information on application information; and

3) sending one copy of the application to the appropriate regional office, one copy to the Austin office, one copy to any local programs (if any) and keeping one copy.

Activities which require public notice should be planned well in advance to allow for a permit processing time of around 90 days. Public involvement such as public meetings and/or public hearings could greatly increase the processing time.

GENERAL RULES

101.4 NUISANCE

No person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious

to or to adversely affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property.

Sample Emission Calculations for a Feedmill Operation

The following emission calculations are provided only as an example. These calculations are based on typical equipment and commodities that are processed at a feedmilling operation. Any emission calculations that are submitted to the TACB should include any assumptions and references for all emissions factors used and samples of all emission calculations performed. The following steps should be taken when calculating emissions from a feedmill facility.

Step 1. The applicant should identify all emission points located at the feedmill facility. Normally, these emission points are commodity receiving pits (truck or railcar), all open transfer points, controlled processing equipment (bagfilters on hammermills, cyclones on pellet coolers, bagfilters on turnheads, etc.), and commodity loadout areas (truck or railcar).

Step 2. Once the emission points have been identified, the applicant should list all commodities received at the feedmill facility. In addition, all hourly and annual receiving rates for these commodities should be provided. Hourly receiving rates can be determined by the maximum number of truck or railcar loads that can be unloaded in the facility's receiving pits in one hour. Annual receiving rates can be estimated on the annual usage of each commodity. This estimation of receiving rates should be conducted for all commodities.

Step 3 Make a fan chart for all proposed abatement devices. The fan chart should include the emission point number, it's purpose (ie, hammermill # 1 fan), type of control device (ie. bagfilter), and average and maximum flow rates (dscfm).

Step 4. Estimate the hourly and annual emission rates for each emission point. All emission rates should be based on the maximum hourly and annual throughput capacity for that particular emission point. In addition, any control efficiencies used to reduce the emissions from an emission point should be justified and provided in the emission calculations.

EXAMPLE CALCULATIONS

Emission Points

Emission point 1: Truck Receiving Pit

Emission point 2: Railcar Receiving Pit No. 1 Bagfilter

Emission point 3: Railcar Receiving Pit No. 2

Emission point 4: Pneumatic Receiving System Bagfilter

Emission point 5: Receiving Turnhead System Bagfilter

Emission Point 6: Hammermilling System No. 1 Bagfilter

Emission Point 7: Hammermilling System No. 2 Bagfilter

Emission Point 8: Ground Grain Turnhead System Bagfilter

Emission Point 9: Feed Mixing System Bagfilter

Emission Point 10: Mixed Feed Turnhead System Bagfilter

Emission Point 11: Pellet Cooler System Scrubber

Emission Point 12: Truck Loadout

Emission Point 13: 500 hp Boiler

Commodities Received in Truck and Railcar Receiving Pits

Commodity	Tons/ Truck	Tons/RRcar	Trucks/Hr	RRcars/Hr	Max Hrly Truck Rec. (TPH)	Max Hrly Rail Rec. (TPH)	Max Ann. Trucks Rec. (TPY)	Max Ann.Rail Rec. (TPY)
Whole Grains	25	200	8	1	200	200	100,000	336,200
Soybean Meal	25	200	8	1	200	200	45,400	100,000
Totals:							145,400	436,200

Commodities Received Pneumatically

Commodity	Tons/Truck	Trucks/Hr	Max Hrly Truck Rec. (TPH)	Max Ann. Truck Rec. (TPY)
Poultry Meal	20	1	20	29,080
Calcium	20	1	20	29,080
Salt	20	1	20	29,080
Bulk Minerals	20	1	20	29,080
Molasses	20	1	20	29,080
Total				145,400

Fan Chart

Emission Point No.	Purpose	Control Device	Expected Flowrate (dscfm)
2	Railcar Receiving	Bagfilter	12,400
4	Pneumatic Receiving	Bagfilter	2,500
5	Receiving Turnhead	Bagfilter	2,000
6 & 7	Hammermilling	Bagfilters	3,500 (for each)
8	Ground Grain Turnhead	Bagfilter	2,000
9	Feed Mixing	Bagfilter	4,000
10	Mixed Feed Turnhead	Bagfilter	2,000
11	Pellet Coolers	Scrubber	50,000

1. TRUCK RECEIVING PIT:

- Assume the worst case hourly emissions for receiving are from bobtail dump trucks. Assume that only one type of commodity is received at a time.
- Assume 80% of the material being received by the bobtail dump trucks is choke fed (if the pit remains full in order to minimize the "free-fall" of grain).
- Assume the remaining 20% of the emissions are uncontrolled.
- Assume emissions are reduced by 90% during choke feeding.

The following set of calculations represent those emissions controlled through choke feeding from bobtail dump trucks--

Hourly:

$$\text{TSP} = 200 \frac{\text{tons}}{\text{hour}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times (1-.90)^{(c)} \times 0.80^{(d)} = 2.88 \frac{\text{lbs}}{\text{hour}}$$

$$\text{PM}_{10} = 200 \frac{\text{tons}}{\text{hour}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.15^{(e)} \times (1-.90)^{(c)} \times 0.80^{(d)} = 1.44 \frac{\text{lbs}}{\text{hour}}$$

The following set of calculations represent those emissions considered to be uncontrolled--

$$\text{TSP} = 200 \frac{\text{tons}}{\text{hour}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times 0.20^{(d)} = 7.20 \frac{\text{lbs}}{\text{hour}}$$

$$\text{PM}_{10} = 200 \frac{\text{tons}}{\text{hour}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.15^{(e)} \times 0.20^{(d)} = 3.60 \frac{\text{lbs}}{\text{hour}}$$

Both controlled and uncontrolled emissions should be combined to receive the total maximum hourly emission rate for the receiving pit--

$$\text{TSP} = 2.88 \frac{\text{lbs}}{\text{hour}} + 7.20 \frac{\text{lbs}}{\text{hour}} = \mathbf{10.08 \frac{\text{lbs}}{\text{hour}}}$$

$$\text{PM}_{10} = 1.44 \frac{\text{lbs}}{\text{hour}} + 3.60 \frac{\text{lbs}}{\text{hour}} = \mathbf{5.04 \frac{\text{lbs}}{\text{hour}}}$$

Annual:

- Assume 50% of grains and commodities are received by bobtail dump trucks, and 50%

of grains and commodities are received by hopper bottom trucks.

- Assume 90% of the material received by hopper bottom trucks is choke fed (if the pit remains full in order to minimize the "free-fall" of grain).

- Assume the remaining 10% of the emissions are uncontrolled.

The following set of calculations represent those emissions controlled through choke feeding from **bobtail dump trucks**–

$$\text{TSP} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times (1\text{-}.90)^{(c)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.80^{(d)} \times 0.50 = 0.52 \frac{\text{tons}}{\text{year}}$$

$$\text{PM}_{10} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.15^{(e)} \times (1\text{-}.90)^{(c)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.80^{(d)} \times 0.50 = 0.26 \frac{\text{tons}}{\text{year}}$$

The following set of calculations represent those emissions controlled through choke feeding from **hopper bottom trucks**--

$$\text{TSP} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times (1\text{-}.90)^{(c)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.90^{(d)} \times 0.50 = 0.59 \frac{\text{tons}}{\text{year}}$$

$$\text{PM}_{10} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.15^{(e)} \times (1\text{-}.90)^{(c)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.90^{(d)} \times 0.50 = 0.29 \frac{\text{tons}}{\text{year}}$$

The following set of calculations represent those emissions considered to be uncontrolled from **bobtail dump trucks**--

$$\text{TSP} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.20^{(d)} \times 0.50 = 1.31 \frac{\text{tons}}{\text{year}}$$

$$\text{PM}_{10} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.15^{(e)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.20^{(d)} \times 0.50 = 0.65 \frac{\text{tons}}{\text{year}}$$

The following set of calculations represent those emissions considered to be uncontrolled from **hopper bottom trucks**--

$$\text{TSP} = 145{,}400 \frac{\text{tons}}{\text{year}} \times 0.6 \frac{\text{lbs}^{(a)}}{\text{ton}} \times 0.3^{(b)} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} \times 0.10^{(d)} \times 0.50 = 0.65 \frac{\text{tons}}{\text{year}}$$

year ton 2000 lbs year

PM_{10} = 145,400 tons x 0.6 lbs[(a)] x 0.15[(e)] x 1 ton x 0.10[(d)] x 0.50 = 0.33 tons
year ton 2000 lbs year

Both controlled and uncontrolled emissions should be combined to receive the total maximum annual emission rate for the receiving pit--

TSP = 0.52 tons + 1.31 tons + 0.59 tons + 0.65 tons= **3.07 tons**
year year year year **year**

PM_{10} = 0.26 tons + 0.65 tons + 0.29 tons + 0.33 tons= **1.53 tons**
year year year year **year**

2. RAILCAR RECEIVING PIT NO. 1 (BAGFILTER SYSTEM):

- Assume that since this railcar receiving area is in a building, with suction being pulled, and the doors are closed while receiving grain and commodities that this emission point will not have any fugitive emissions. The only emissions from this point will be point source emissions from the bagfilter system.

- Assume emissions from the bagfilter are PM_{10} or smaller.

Hourly:

PM_{10} = 0.01 gr[(f)] x 12,400 dscf x 1 lb x 60 min. = **1.06 lbs**
dscf min. 7000 grains hour **hour**

Annual:

Assume this railcar receiving pit receives half of the total annual railcar throughput.

Total Material Received = 436,200 tons/yr ÷ 2

= 218,100 tons/year

PM_{10} = 1.06 lbs x 218,100 tons ÷ 200 tons x 1 ton = **0.58 tons**
hour year hour 2000 lbs **year**

3. RAILCAR RECEIVING PIT NO. 2:

- Assume the worst case emissions for receiving are those for the whole grains. Assume that only one type of commodity is received at a time.

- Assume 95% of the material received by the hopper bottom railcars is choke fed (if the pit remains full in order to minimize the "free-fall" of grain).

- Assume the remaining 5% of the emissions are uncontrolled.

- Assume emissions are reduced by 90% during choke feeding.

Hourly:

The following set of calculations represent those emissions controlled through choke feeding--

TSP = 200 tons x 0.6 $lbs^{(a)}$ x $0.3^{(b)}$ x $(1-.90)^{(c)}$ x $0.95^{(d)}$ = 3.42 lbs
hour ton hour

PM_{10} = 200 tons x 0.6 $lbs^{(a)}$ x $0.15^{(e)}$ x $(1-.90)^{(c)}$ x $0.95^{(d)}$= 1.71 lbs
hour ton hour

The following set of calculations represent those emissions considered to be uncontrolled--

TSP = 200 tons x 0.6 $lbs^{(a)}$ x $0.3^{(b)}$ x $0.05^{(d)}$ = 1.80 lbs
hour ton hour

PM_{10} = 200 tons x 0.6 $lbs^{(a)}$ x $0.15^{(e)}$ x $0.05^{(d)}$ = 0.90 lbs

hour ton hour

Both controlled and uncontrolled emissions should be combined to receive the total maximum hourly emission rate for each receiving pit--

TSP = 3.42 lbs/hour + 1.80 lbs/hour = **5.22 lbs/hour**

PM_{10} = 1.71 lbs/hour + 0.90 lbs/hour = **2.61 lbs/hour**

Annual:

Assume this railcar receiving pit receives half of the total annual railcar throughput.

Total Material Received = 436,200 tons/yr ÷ 2

= 218,100 tons/year

The following set of calculations represent those emissions controlled through choke feeding--

TSP = 218,100 tons/year x 0.6 lbs[(a)]/ton x 0.3[(b)] x (1-.90)[(c)] x 1 ton/2000 lbs x 0.95[(d)] = 1.86 tons/year

PM_{10} = 218,100 tons/year x 0.6 lbs[(a)]/ton x 0.15[(e)] x (1-.90)[(c)] x 1 ton/2000 lbs x 0.95[(d)] = 0.93 tons/year

The following set of calculations represent those emissions considered to be uncontrolled--

TSP = 218,100 tons/year x 0.6 lbs[(a)]/ton x 0.3[(b)] x 1 ton/2000 lbs x 0.05[(d)] = 0.98 tons/year

PM_{10} = 218,100 tons/year x 0.6 lbs[(a)]/ton x 0.15[(e)] x 1 ton/2000 lbs x 0.05[(d)] = 0.49 tons/year

Both controlled and uncontrolled emissions should be combined to receive the total maximum annual emission rate for each receiving pit--

TSP = 1.86 tons + 0.98 tons = **2.84 tons**
year year **year**

PM_{10} = 0.93 tons + 0.49 tons = **1.42 tons**
year year **year**

6 & 7. HAMMERMILLING SYSTEMS NO. 1 & 2 (BAGFILTER SYSTEMS):

Emission calculations for all other bagfilter systems should be calculated in the same manner as the railcar receiving bagfilter system. The only difference would be that the throughput capacities both hourly and annually should be based on the capacities of the equipment those bagfilter systems are controlling (see following example).

- Two hammermills with an hourly capacity of 50 tons each.
- Assume each hammermill operates simultaneously and both are counted as individual emission points.
- Assume emissions from bagfilters are PM_{10} or smaller.
- Assume annual throughput of facility is split between both hammermills.

Hourly:

PM_{10} = 0.01 $gr^{(f)}$ x 3,500 dscf x $\frac{1 \text{ lb}}{7000 \text{ grains}}$ x 60 min. = **0.30 lbs**
dscf min. hour **hour ea.**

Annual:

Total all commodities that are processed through the particular piece of equipment or transfer point on a per year basis.

Total Material Processed Through Each Hammermill = 436,200 tons/year ÷ 2 hammermills

= 218,100 tons/year per hammermill

PM_{10} = 0.30 lbs x 218,100 tons ÷ 50 tons x 1 ton = **0.65 tons**

hour year hour 2000 lbs **year ea.**

11. PELLET COOLER SYSTEM SCRUBBER:

- Two pellet coolers with an hourly capacity of 55 tons each.
- Each cooler vents to dual cyclones that operate simultaneously. The cyclone exhausts are then vented to a properly sized chemical scrubber. The scrubber is the only emission point.
- Assume emissions from cyclones are PM_{10} or smaller.
- Assume annual throughput of facility is split between both pellet coolers.

Hourly:

PM_{10} = 55 tons/hour x 2 pellet coolers x 0.1 lb/ton [(g)] = 11.00 lbs/hour vented into scrubber

11.00 lbs x (1-.80) [(h)] = **2.20 lbs emissions vented from scrubber to atmosphere**

hour **hour**

Annual:

Total Material Processed Through Coolers = 727,000 tons/yr

PM_{10} = 727,000 tons/year x 0.1 lb/ton x 1 ton/2000 lbs = 36.35 tons/year vented into scrubber

36.35 tons x (1-.80)[(h)] = **7.27 tons emissions vented from scrubber to atmosphere**

year **year**

12. TRUCK LOADOUT:

- No more than one truck will loadout at a time.

- Loadout area is totally enclosed with no suction; assume 90% control of emissions.

Hourly:

8 trucks/hour x 25 tons/truck = 200 tons/hour

TSP = 200 tons x 0.3 lbs[(a)] x 0.3[(b)] x (1-.90)[(c)] = **0.90 lbs**

hour ton **hour**

PM_{10} = 200 tons x 0.3 lbs[(a)] x 0.15[(e)] x (1-.90)[(c)] = **0.45 lbs**

hour ton **hour**

Annual:

Total all commodities that are utilized to make the finished pellets.

Total Materials = 145,400 tons/year + 436,200 tons/year + 145,400 tons/year

= 727,000 tons/year

TSP = 727,000 tons x 0.3 lb [(a)] x 0.3[(b)] x (1-.90)[(c)] x 1 ton = **3.27 tons**

year ton 2000 lbs **year**

PM_{10} = 727,000 tons x 0.3 lbs[(a)] x 0.15[(e)] x (1-.90)[(c)] x 1 ton = **1.64 tons**

year ton 2000 lbs **year**

13. 500 HP BOILER:

- 500 hp industrial boiler at 20 million Btu/hour
- Maximum fuel flow rate of 20,925 ft^3/hour and 183,303,000 ft^3/year of natural gas
- Operating schedule: 24 hrs/day x 7 days/week x 52 weeks/yr = 8,760 hrs/yr

Hourly:

PM_{10} = 20,925 ft^3 x 13.7 lbs [(i)] = **0.29 lbs**

hour 10^6 ft^3 **hour**

SO_2 = 20,925 ft^3 x 0.6 lbs [(i)] = **0.01 lbs**

hour 10^6 ft^3 **hour**

NO_x = 20,925 ft^3 / hour x 140 lbs / 10^6 ft^3 [(i)] = **2.93 lbs / hour**

CO = 20,925 ft^3 / hour x 35 lbs / 10^6 ft^3 [(i)] = **0.73 lbs / hour**

VOC = 20,925 ft^3 / hour x 5.8 lbs / 10^6 ft^3 [(i)] = **0.12 lbs / hour**

Annual:

PM_{10} = 20,925 ft^3 / hour x 8,760 hours / year x 13.7 lbs / 10^6 ft^3 [(i)] x 1 ton / 2000 lbs = **1.26 tons / year**

SO_2 = 20,925 ft^3 / hour x 8,760 hours / year x 0.6 lbs / 10^6 ft^3 [(i)] x 1 ton / 2000 lbs = **0.06 tons / year**

NO_x = 20,925 ft^3 / hour x 8,760 hours / year x 140 lbs / 10^6 ft^3 [(i)] x 1 ton / 2000 lbs = **12.83 tons / year**

CO = 20,925 ft^3 / hour x 8,760 hours / year x 35 lbs / 10^6 ft^3 [(i)] x 1 ton / 2000 lbs = **3.21 tons / year**

VOC = 20,925 ft^3 / hour x 8,760 hours / year x 5.8 lbs / 10^6 ft^3 [(i)] x 1 ton / 2000 lbs = **0.53 tons / year**

References: (all assumptions should be justified and references should be provided where applicable)

(a) AP-42, EPA Compilation of Air Pollutant Emission Factors for a Country Elevator, table 6.4-1, 1988. Assume dust generated during the receiving, mixing, and handling of all bulk commodities is similar to that of a receiving pit at a country grain elevator. For factors

associated with emissions from drying operations, see footnote b of table 6.4-1 of AP-42.

(b) Texas Air Control Board in-house memo dated 12-11-79 from Pete Roberts to Cecil Bradford. The assumption expressed in this memo were based on a Midwest Research Institute Report entitled Potential Dust Emissions from Grain Elevators in Kansas City, MO. Based on this sieve analysis, assume that only 30% of dust emitted from an uncontrolled grain source represents total suspended particulate matter (30 microns or smaller in diameter).

(c) Accepted efficiencies given for certain control devices/measures that minimize fugitive emissions only (not to be utilized on point sources). Any other control efficiencies should be well justified and submitted with references if possible. Accepted efficiencies include:

Enclosed receiving or loadout area with doors and/or flexible strips (canvas or plastic) and suction being
pulled = 100%
Flexible strips (canvas or plastic) and choke feeding = 95%
Enclosed receiving or loadout area with no suction = 90%
Choke feeding on receiving operations = 90%
Mineral oil application = 90%

(d) Accepted percentages of grain that can be choke fed for different receiving methods:
Hopper bottom railcar = 95%
Hopper bottom truck = 90%
Bobtail dump truck = 80%

A hopper bottom railcar is assumed to have a greater percentage that can be choke fed as opposed to a hopper bottom truck due to its size.

(e) AP-42, EPA Compilation of Air Pollutant Emission Factors, Appendix C.2, Table C.2-2. Assume that only 15% of dust emitted from an uncontrolled grain source represents all particulate matter 10 microns or smaller in diameter.

(f) AP-40, Air Pollution Engineering Manual, Air and Waste Management Association, 1991, Page 115. "Well designed and operated baghouses have been shown to be capable of reducing overall particulate emissions to less than 0.01 gr/dscf"...."in some cases as low as 0.01 - 0.005 gr/dscf".

(g) AP-42, EPA Compilation of Air Pollutant Emission Factors for Grain Processing Operations, table 6.4-3, 1977. Assume emissions are no greater than that of a grinder controlled with a cyclone.

(h) AP-42, EPA Compilation of Air Pollutant Emission Factors, Appendix C.2, Table C.2-3. Typical Collection Efficiencies of Various Particulate Control Devices.

(i) AP-42, EPA Compilation of Air Pollutant Emission Factors for Natural Gas Combustion, tables 1.4-1, 1.4-2, and 1.4-3, 1992.